cessful. When drug therapy is used as an alternative to operating to induce fertility, prolonged and perhaps lifetime surveillance may be needed to assess tumor growth.

Pituitary transsphenoidal microsurgery remains the preferred treatment for prolactinomas. Successful removal of microtumors with preservation of pituitary function is possible in up to 90 percent of cases. Restoration of menses and cessation of galactorrhea can be achieved in as many as 75 percent of patients, although PRL levels are restored to normal in only 50 percent of them. Finally, the minimal mortality and morbidity rates of this operation, when carried out by an experienced surgeon, indicate that it is the best treatment for prolactinomas available at present.

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Prenatal Diagnosis of Short-Limbed Dwarfism by Ultrasonography

ULTRASONOGRAPHY has greatly improved our ability to diagnose fetal malformations prenatally. Many anomalies of the fetal neural axis, bowel and kidneys have been described, and in the last two years considerable attention has been directed toward abnormalities of the fetal bony skeleton.

Ultrasonic diagnosis of short-limbed dwarfism is accomplished by measuring the length of the fetal femurs. The length of the femoral diaphysis, readily measured with real-time ultrasonographic systems, is compared with the biparietal diameter as an "internal" control of fetal size variability. Normal values have been established for femur lengths from the end of the first trimester to early third trimester and 99 percent confidence limits have been set.

In patients at risk for having babies with short-limbed bone dysplasias, we begin femur measurements at approximately 18 to 20 weeks after the last menstrual period (LMP). If the initial measurement falls within the normal range, serial measurements should be obtained at two-week intervals until either the femur length falls into the abnormal range or the 28th week is reached and normalcy is established.

Thus far, successful diagnoses have been established in fetuses before 22 weeks of age (based on LMP) in the Ellis-van Creveld syndrome, diastrophic dwarfism, achondrogenesis and homozygous achondroplasia. In addition, an unclassified but severe dwarf syndrome has been accurately predicted before 22 weeks menstrual age. Three cases of heterozygous achondroplasia were diagnosed but the presence of short femurs was not confirmed until after 24 weeks menstrual age. In eight patients at risk for having babies with dwarf syndromes, fetuses were diagnosed as showing no abnormalities and, subsequently, the diagnoses proved correct.

The most interesting observation in this series to date, other than the dramatic accuracy in this small sample of patients, is the fact that limb growth in dwarfs occurs differently in heterozygous achondroplasia than in homozygous achondroplasia or other more severe forms of dwarfism. Not only does this fact enable one to separate homozygous from heterozygous achondroplasia by a simple and safe examination, but it establishes differences in bone growth that were not previously recognized.

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Intrauterine Growth Retardation

THE DIAGNOSIS of intrauterine growth retardation (IUGR) is appropriate for any neonate whose birth weight is less than the tenth percentile for its gestational age. This aberration in growth may result from numerous causes, but the most common include maternal vascular disease, multiple gestations, chromosomal and other isolated malformations of the fetus and fetal viral infections.

Initially, the diagnosis is suspected when the uterine size is too small for the presumed gestational age of the fetus. Ultrasonographic evaluation

confirms the diagnosis by showing a decreased rate of growth of the fetal biparietal diameter and a decrease in the total intrauterine volume associated with oligohydramnios. More recently, concomitant measurements of head-to-body circumference ratios have proved helpful in delineating IUGR.

When it has been determined that an aberration in growth exists during pregnancy, management includes counseling of parents, consultation with a neonatologist and tests to evaluate fetal well-being. The latter include electronic monitoring of the fetal heart rate responses to fetal movement and to uterine contractions. If these responses are normal and maternal vascular disease is absent, the patient may continue her pregnancy to term. Consideration of delivery before term may be an option when fetal lung maturity has been achieved. Because poor oxygenation often results in birth asphyxia in these infants during labor, fetal heart rate monitoring is indicated; a cesarean section should be seriously considered.

A neonate with IUGR has a constellation of problems which may include birth asphyxia with its associated complications of meconium aspiration pneumonitis and central nervous system depression as well as hypoglycemia, hypocalcemia, temperature instability and polycythemia. Problems related to congenital malformations and infections also occur. Close observation to prevent birth asphyxia in the prepartum and intrapartum periods and intensive neonatal supportive care result in the best long-term outcome.

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Recent Advances in Prenatal Diagnosis of Genetic Defects

A SIGNIFICANT ADVANCE in medical genetics is the ability to make an in utero diagnosis of genetic defects. The study of amniotic fluid constituents allows the diagnosis of all chromosomal and many metabolic abnormalities. However, some disorders are not manifested by changes in amniotic fluid constituents. The development of fetoscopy and the ability to obtain fetal blood specimens makes possible prenatal diagnosis of diseases not possible by amniocentesis—among these are the hemoglobinopathies.

Since the first reports of the prenatal diagnosis of a hemoglobinopathy over 700 pregnancies have been monitored. Both structural abnormalities (such as sickle cell) and abnormalities of synthesis rates of globin chains can be diagnosed in utero. The risk of fetal death and spontaneous abortion from fetoscopy and fetal blood sampling is approximately 4 percent to 5 percent when done by an experienced physician.

Some cases of sickle cell anemia can be diagnosed in utero using only amniocentesis. These techniques involve use of restriction endonucleases, enzymes which cleave DNA within specific base-sequence recognition sites. There is an endonuclease-defined DNA mutation on the same chromosome as (but not part of or related to) the sickle mutation in 50 percent to 60 percent of American blacks carrying the sickle mutation. Therefore, in this proportion of the families at risk, a prenatal diagnosis can be accomplished with amniotic fluid cells (which contain DNA) instead of fetoscopic blood sampling.

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The Value of Microsurgery in Tubal Repair

THE MICROSURGICAL APPROACH has been applied to every form of tubal repair, but its value has been definitely established only in reversal of female sterilization. Microsurgery appears to be of some value in repair of salpingostomy in cases of chronic pelvic inflammatory disease in that it results in 25 percent to 30 percent intrauterine pregnancies; at the same time, however, it increases the rate of ectopic pregnancies from between 2 percent and 4 percent to between 10 percent and 18 percent. It is of technical value in implantation procedures, but in only one report has the technique improved the percentage of intrauterine pregnancies reaching term.

Success with reversal of sterilization largely depends on how the sterilization was originally done. Unipolar cautery yields the worst prognosis for reversal whereas use of a tubal clip appears to